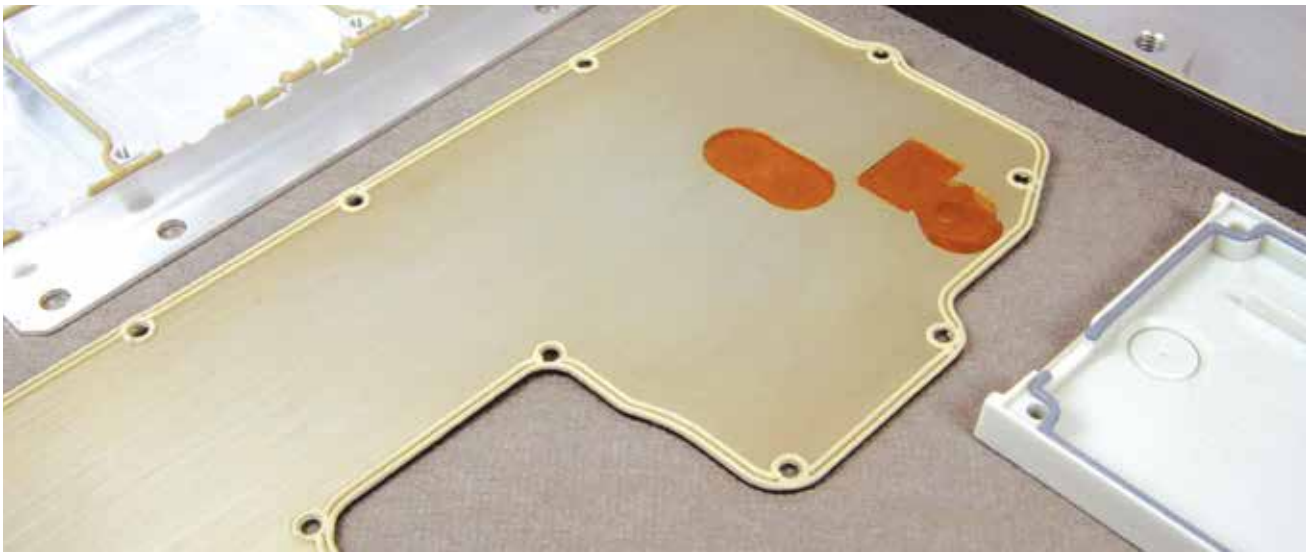
Form-in-Place Gaskets



Product Overview

Kemtron Form-in-Place (FIP) Elastomer compounds are directly dispensed onto component hardware or enclosure via a pressurised fluid dispensing system on a numerically controlled XYZ table to form a gasket for RFI/EMI shielding and/or environmental seal for dust and moisture. The dispensing machine deposits the gasket by following a pre-determined CNC path to provide accuracy and repeatability.

The process advantages are:

- Component is integrated with EMI shielding and/or environmental gasket.
- Materials are one-component room curable.
- Assembly time is reduced as gasket is included on component.
- Rapid prototyping.
- Low setup costs.
- Smaller gasket land required.
- Variety of materials available to optimise shielding and galvanic compatibility.
- No material waste.
- Excellent EMI shielding.
- Can be applied to metal and plastic components.

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Applications

Suited to applications where small, intricate gasket profiles are required, such as on multi-compartment labyrinth housings with minimum gasket land area where traditional larger types of gasket are not suitable. This process also negates the assembly costs associated with traditional gaskets as the Form-in-Place gasket becomes an integral part of the housing or enclosure. The process is suitable for depositing on both metal and metallised plastic components/housing.

Availability

Kemtron can dispense FIP gaskets directly onto the customer's free issue hardware or can procure the component hardware thereby reducing the customer's supply base. Kemtron can also supply FIP compounds in syringes or Semco® cartridges for the customer's own use.

Form-in-Place gasket materials include:

For RFI/EMI Shielding

- Silver plated copper filled silicone.
- Silver plated aluminium filled silicone.
- Silver plated nickel filled silicone.
- Nickel coated graphite filled silicone.

For Environmental Sealing only

- Unfilled silicone.

Design Considerations

- To achieve optimum EMI shielding performance the component surface on which the gasket is to be deposited must be highly conductive as low contact resistance is required between the two. Chromate finishes on aluminium must be conductive.
- The gasket height can be specified between 0.4mm to 2.0mm, gasket width will typically be 1.5 x the gasket height. General tolerance is ± 0.1mm.
- Recommended gasket compression is between 20% and 30%. Over-compression can damage the gasket and as compression stops cannot be incorporated into the gasket they should be designed into the component hardware.
- Gasket path for the deposition can be determined from a sample part, drawings or CAD files.

Production Capability

To meet the varying demands of customer requirements Kemtron has developed its own CNC Form-in-Place dispenser. FIP gasketing work has become a regular feature of our production work and we are able to provide a reliable, accurate and quick response to even high volume orders.

Notice

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Materials

Silver Plated Copper Particles in Silicone Elastomer FIPSSC

Density	3.3g/cm^{-3}
Hardness	40 Shore A
Volume resistivity	<0.01Ω.cm
Adhesion	>50 N/cm^{-2}
Attenuation – 100 MHz to 10 GHz (MIL-STD 285)	100-120 dB (typically)
Compression recommended – (allowable range)	25% (10 – 50%)
Gasket resistance	<0.5Ω.cm^{-1}
Elongation	100%
Compression set – 70 hrs at 23°C	<20%
Service temperature range	-55°C to 125°C
Force/deflection – 0.7mm high gasket section	1.4 N/cm^{-1} @ 10%
	3.3 N/cm^{-1} @ 25%
	14.8 N/cm^{-1} @ 50%

Silver Plated Aluminium Particles in Silicone Elastomer FIPSSA

Density	2.0g/cm^{-3}
Hardness	50 Shore A
Volume resistivity	<0.01Ω.cm
Adhesion	>50 N/cm^{-2}
Attenuation – 100 MHz to 10 GHz (MIL-STD 285)	85-110 dB (typically)
Compression recommended – (allowable range)	25% (10 – 50%)
Gasket resistance	<0.5Ω.cm^{-1}
Elongation	100%
Compression set – 70 hrs at 23°C	<20%
Service temperature range	-55°C to 125°C
Force/deflection – 0.7mm high gasket section	1.5 N/cm^{-1} @ 10%
	3.5 N/cm^{-1} @ 25%
	16 N/cm^{-1} @ 50%

Nickel Plated Graphite Particles in Silicone Elastomer FIPSNG

Density	2.5g/cm^{-3}
Hardness	50 Shore
Volume resistivity	<0.01Ω.cm
Adhesion	>50 N/cm^{-2}
Attenuation – 100 MHz to 10 GHz (MIL-STD 285)	85-110 dB (typically)
Compression recommended – (allowable range)	25% (10 – 50%)
Gasket resistance	<0.5Ω.cm^{-1}
Elongation	100%
Compression set – 70 hrs at 23°C	<20%
Service temperature range	-55°C to 150°C
Force/deflection – 0.7mm high gasket section	2.8 N/cm^{-1} @ 10%
	7.4 N/cm^{-1} @ 25%
	26.4 N/cm^{-1} @ 50%

Silver Plated Nickel Particles in Silicone Elastomer FIPSSN

Density	3.6g/cm^{-3}
Hardness	45 Shore A
Volume resistivity	<0.01Ω.cm
Adhesion	>50 N/cm^{-2}
Attenuation – 100 MHz to 10 GHz (MIL-STD 285)	90-110 dB (typically)
Compression recommended – (allowable range)	25% (10 – 50%)
Gasket resistance	<0.5Ω.cm^{-1}
Elongation	100%
Compression set – 70 hrs at 23°C	<20%
Service temperature range	-55°C to 150°C
Force/deflection – 0.7mm high gasket section	1.7 N/cm^{-1} @ 10%
	4.1 N/cm^{-1} @ 25%
	20.7 N/cm^{-1} @ 50%

Typical Form-in-Place Deposits